

WHAT IS CLAIMED IS:

(59)

- 5 1. Use of an agricultural composition for enhancing plant crop seed germination and/or seedling emergence and/or growth of a plant crop comprising a growth-promoting amount of at least one lipo chitooligosaccharide (LCO) together with an agriculturally suitable carrier.
2. The use according to claim 1, wherein said plant crop is a non-legume.
- 10 3. The use according to claim 2, wherein said plant crop is selected from the group consisting of Poaceae, Cucurbitaceae, Malvaceae, Asteraceae, Chenopodiaceae, Solanaceae and Brassicaceae.
4. The use according to claim 3, wherein said plant crop is selected from the group consisting of corn, cotton, cucumber, cantaloupe, lettuce, beet, canola and potato.
- 15 5. The use according to one of claims 1 to 4, wherein said LCO is obtainable from a rhizobia selected from the group consisting of *Bradyrhizobium japonicum*, *Rhizobium meliloti* and *Rhizobium leguminosarum*.
- 20 6. The use according to claim 5, wherein said LCO is present in said composition at a concentration of between about  $10^{-5}$  M to about  $10^{-14}$  M.
7. The use according to claim 5, wherein said LCO is present in said composition at a concentration of between about  $10^{-6}$  M to about  $10^{-12}$  M.
- 25 8. The use according to claim 5, wherein said LCO is present in said composition at a concentration of between about  $10^{-7}$  M to about  $10^{-10}$  M.

9. The use according to one of claims 1 to 8, wherein said composition is effective in enhancing seed germination and/or seedling emergence and/or growth of a plant crop grown under field conditions.

10. The use according to claim 1, wherein said plant is a member of the Fabaceae family.

11. The use according to claim 10, wherein said plant is selected from the group consisting of soybean, bean, alfalfa and clover.

12. The use according to claim 10 or 11, wherein said LCO is obtainable from a rhizobia selected from the group consisting of *Bradyrhizobium japonicum*, *Rhizobium meliloti* and *Rhizobium leguminosarum*.

13. The use according to claim 12, wherein said LCO is present in said composition at a concentration of between about  $10^{-5}$  M to about  $10^{-14}$  M.

14. The use according to claim 12, wherein said LCO is present in said composition at a concentration of between about  $10^{-6}$  M to about  $10^{-12}$  M.

15. The use according to claim 12, wherein said LCO is present in said composition at a concentration of between about  $10^{-7}$  M to about  $10^{-10}$  M.

16. The use according to one of claims 10 to 15, wherein said composition is effective in enhancing seed germination and/or seedling emergence and/or growth of a plant crop grown under field conditions.

17. A use of a composition for breaking the dormancy and/or quiescence of a plant comprising a growth-promoting amount of at least one lipo chitooligosaccharide (LCO) together with an agriculturally suitable carrier.

18. The use according to claim 17, wherein said plant is a member of the family of Solonaceae.

19. The use according to claim 18, wherein said plant is a potato.

5 20. The use according to claim 19, wherein said growth-promoting activity of said composition enables an increase in yield.

21. The use according to claim 19, further comprising gibberellic acid.

10 22. A method for enhancing seed germination and/or seedling emergence and/or growth of a plant, comprising a treatment in the vicinity of one of a seed, root or plant with a composition comprising an agriculturally effective amount of a lipo chitooligosaccharide (LCO) in admixture with an agriculturally suitable carrier medium, wherein said effective amount enhances seed germination and/or seedling emergence and/or growth of said plant in comparison to an untreated plant.

23. The method of claim 22, wherein said composition comprises at least one LCO at a concentration of between about  $10^{-5}$  M to about  $10^{-14}$  M.

20 24. The method of claim 23, wherein said composition comprises at least one LCO at a concentration of between about  $10^{-6}$  M to about  $10^{-12}$  M.

25. The method of claim 24, wherein said composition comprises at least one LCO at a concentration of between about  $10^{-7}$  M to about  $10^{-10}$  M.

25 26. A method for enhancing seed germination and/or seedling emergence and/or growth of a plant crop comprising incubating a rhizobial strain which expresses a lipo chitooligosaccharide (LCO) in the

vicinity of one of a seed and/or root of said plant such that said LCO enhances seed germination and/or seedling emergence and/or growth of said plant crop.

5           27.     The method of claim 26, wherein said plant crop is a non-legume.

          28.     The method of claim 27, wherein said plant crop is selected from the group consisting of Poaceae, Cucurbitaceae, Malvaceae, Asteraceae, Chenopodiaceae, Solanaceae and Brassicaceae.

10           29.     The method of claim 28, wherein said plant crop is selected from the group consisting of corn, cotton, cucumber, cantaloupe, lettuce, beet, canola and potato.

          30.     The method of one of claims 26 to 29, wherein said rhizobia is selected from *Bradyrhizobium japonicum*, *Rhizobium meliloti* and *Rhizobium leguminosarum*.

15           31.     The method of one of claims 26 to 30, wherein said LCO enhances seed germination and/or seedling emergence and/or growth of said plant grown under field conditions.

20           32.     The method of claim 26, wherein said plant crop is a legume in the Fabaceae family and wherein said LCO enhances seed germination and/or seedling emergence and/or growth of said legume grown under field conditions.

25           33.     Use of an agricultural composition for enhancing a non-legume plant crop seed germination and/or seedling emergence and/or growth of a plant grown under field conditions, comprising a growth-promoting amount of at least one lipo chitooligosaccharide (LCO) together with an agriculturally suitable carrier.

34. Use of an agricultural composition for enhancing a leguminous plant crop seed germination and/or seedling emergence and/or growth of a plant grown under field conditions, comprising a growth-promoting amount of at least one lipo chitooligosaccharide (LCO) together with an agriculturally suitable carrier.

Handwritten signatures and initials, including "A1" and "BCY".

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